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Pesticide Fact Sheet Number 69.1
Aluminum Phosphide

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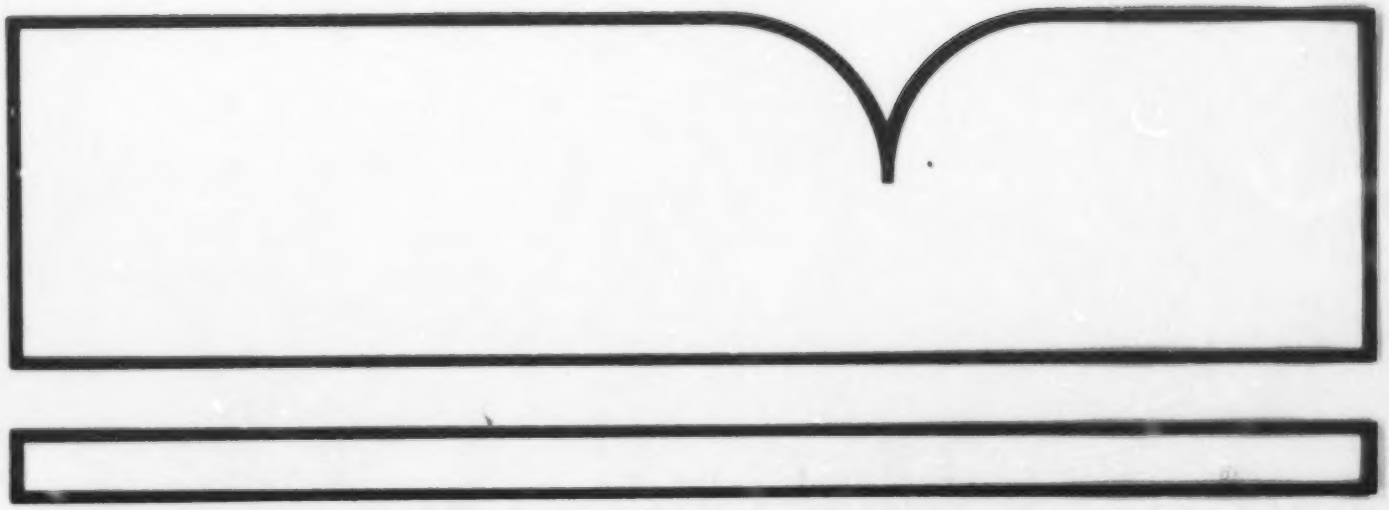

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, Science Findings

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Aluminum Phosphide
Reason for Issuance:
Date Issued: OCT 08 1986
Fact Sheet Number: 69.1

1. Description of Chemical

Generic Name: Aluminum Phosphide
Trade Names: Phostoxin, Phosphume, Phostek, etc.
EPA Shaughnessy Code: 066501
Chemical Abstracts Service (CAS) Number: 20859-73-8
Year of Initial Registration: 1978
Pesticide Type: Solid
Chemical Family: Inorganic Phosphides
U. S. and Foreign Producers: Degesch America, Inc.; Research Products Co., Pestcon Systems, Inc.; Bernardo Chemicals.

2. Use Patterns and Formulations

Application Sites: Indoor fumigation of agricultural food commodities, animal feeds, processed food commodities and non-food commodities (tobacco). Outdoor fumigation for burrowing rodent and mole control.

Application Rates: 30 tablets or 75 pellets per square foot for fumigation of mills and warehouses; 1-4 tablets or 5-20 pellets for rodent burrows.

Formulations: Tablets and pellets; powders in bags, envelopes and other types of containers.

3. Science Findings

Summary Science Statement: The Agency has determined that the registered uses of this chemical will not generally cause unreasonable adverse effects to humans or the environment if used in accordance with the approved use directions and revised precautionary statements prescribed by the registration standard.

Chemical Characteristics: Solid, dark gray material (granules, or powder), molecular weight 57.96; material must be protected from moisture in the atmosphere in air-tight containers; contact of the solid material with moisture in the air, or with water, or acids release phosphine, a highly toxic gas.

Toxicology Characteristics: Requirements for acute toxicity data have been waived because of the well known extreme inhalation toxicity of phosphine gas which it generates. Accordingly, aluminum phosphide has been placed in toxicity category I, the highest toxicity category.

No chronic toxicology studies are required with respect to dietary exposure because there is not potential for dietary exposure (tolerances are set at limit of detection).

Toxicology studies on phosphine gas are required to assess the margins of safety for exposed workers and applicators because the Agency does not have adequate data to determine whether phosphine may cause any long term adverse effects to humans.

Environmental Characteristics: Aluminum phosphide reacts with moisture or water to release phosphine gas, which eventually dissipates into the atmosphere. The resulting material from the reaction is aluminum hydroxide, a relatively inert and innocuous material, which is a constituent of clay.

Exposure (monitoring data) and related information are required to help assess the margins of safety for applicators and workers exposed to phosphine gas.

Ecological Characteristics: Phosphine is a highly toxic gas to a wide range of living organisms. Indoor uses pose no risk to non-target organisms outside of the site to be treated. Outdoor end use products (i.e., rodent and mole control) must bear special precautionary labeling to protect endangered species. Manufacturing use products must bear environmental hazard statements for wildlife.

Tolerance Assessment. Tolerances have been established for raw agricultural commodities at a level of 0.1 ppm (40 CFR 180.225); processed foods 0.01 ppm (21 CFR 193.20); and animal feeds 0.1 ppm (40 CFR 561.40). Finished food and feed must be held 48 hours prior to being offered to the consumer; tobacco fumigated in hogsheads must be aerated 72 hours.

4. Summary of Regulatory Position

Aluminum phosphide will remain a Restricted Use Pesticide due to the extreme acute toxicity of phosphine gas which is released from the pesticide when it is exposed to moisture in the air. Therefore, it may by used only by certified applicators or persons under their supervision.

This amended standard adds several new regulatory requirements to the label:

--For retail sale to and unse only by a certified applicator or by persons trained in accordance with the product manual working under the direct supervision and in the physical presence of the certified applicator.

--Respiratory protection is not required if the fumigant is applied from outside of a site such as a railroad car or to fill an automatic dispenser located outside of a structure. However, if the applicator enters a confined space to apply the fumigant, respiratory protection is required. Exposure during application within a confined space may not exceed 0.3 ppm phosphine as an 8 hour time weighted average (TWA). Engineering controls such as forced air ventilation are recommended as the primary means of meeting the exposure standard. Otherwise, an approved respirator must be worn.

--Monitoring must be conducted with a low level detector device to assure that the exposure standard is not exceeded. If monitoring shows that exposure is less than the standard, no respirator is required. If more than 0.3 ppm TWA is encountered, a full face NIOSH/MSHA approved canister respirator is required up to 15 ppm phosphine. This type of respirator must be available during fumigation within a confined space. If more than 15 ppm or unknown levels of phosphine are present, a NOISH/MSHA approved self contained breathing apparatus (SCBA) is required. SCBA must be available at the site or locally such as at a fire department or rescue squad.

--After application, no person may be exposed to more than 0.3 ppm phosphine (maximum concentration). Exposures may occur if the fumigated site leaks into an adjacent indoor area, during transfer of treated commodity, or during reentry into an incompletely aerated space.

--All entrances to a fumigated site must be placarded (except for railroad hopper cars which must be placarded on both side near the ladders and on the top hatch where fumigant was applied). A placard may only be removed after

the commodity is completely aerated. Each fumigated site must be monitored and shown to contain 0.3 ppm or less phosphine in the air space around and in the mass of the commodity. If more than 0.3 ppm is detected, the placard must be transferred with the treated commodity. Persons transferring or handling incompletely aerated commodities must be informed of the presence of phosphine and adequate measures taken to prevent exposure to more than 0.3 ppm.

--When fumigating from within a confined space or when reentering an incompletely aerated space, two trained persons must be present.

5. Summary of Data Gaps:

90 day inhalation study in rats
Teratogenicity study in one species
Mutagenicity battery
Exposure (monitoring data and related information for major sites)

6. Contact Person at EPA

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